

IN THE CLAIMS

Please amend claims 1, 2, 4, 6, 7, 12, 21, 26, 27, 28, 29, 31, 32, 37, 42, 45, and 50 as follows.

Claim 1 (Currently amended): A method for generating a digital image indicative of an internal anatomy of a person ~~over a respiratory cycle~~, comprising:

scanning the internal anatomy of the person at a plurality of positions along an axis to obtain scanning data, wherein the scanning at each position is performed over at least one respiratory cycle of the person;

generating a plurality of cross-sectional digital images based on the scanning data;

generating first and second ~~a plurality of~~ cross-sectional digital image groups associated with first and second respiratory states, respectively, of the person, the first cross-sectional digital image group including first and second digital images of the plurality of cross-sectional digital images obtained at first and second positions, respectively, along the axis, when the person has the first respiratory state, the second cross-sectional digital image group including third and fourth digital images of the plurality of cross-sectional digital images obtained at third and fourth positions, respectively, along the axis, when the person has the second respiratory state, each group comprising at least two digital images of the plurality of cross-sectional digital images wherein each of the two digital images indicate the internal anatomy at a substantially similar respiratory state;

generating first and second 3-D digital images utilizing the first and second cross-sectional digital image groups, respectively ~~a plurality of 3-D digital images, wherein each digital image of the plurality of 3-D digital images is determined from a corresponding one of the plurality of cross-sectional digital image groups; and~~

generating processing the plurality of 3-D digital images to obtain a resultant 3-D digital image indicating positions of at least a portion of the internal anatomy of the person during at least the respiratory cycle utilizing the first and second 3-D digital images.

Claim 2 (Currently amended): The method of claim 1, wherein generating the processing of the plurality of 3-D digital images the resultant 3-D digital image comprises:

performing a minimum intensity projection of the ~~plurality of~~ first and second 3-D digital images to obtain the resultant 3-D digital image.

Claim 3 (Original): The method of claim 2, wherein the resultant 3-D digital image comprises a first region having a first plurality of voxel intensity values indicative of a tumor and a second region having a second plurality of voxel intensity values indicative of the internal anatomy surrounding the tumor, wherein each of the first plurality of voxel intensity values are less than each of the second plurality of voxel intensity values.

Claim 4 (Currently amended): The method of claim 1, wherein ~~generating the processing of the plurality of 3-D digital images~~ the resultant 3-D digital image comprises:

performing a maximum intensity projection of the ~~plurality of first and second~~ 3-D digital images to obtain the resultant 3-D digital image.

Claim 5 (Original): The method of claim 4, wherein the resultant 3-D digital image comprises a first region having a first plurality of voxel intensity values indicative of a tumor and a second region having a second plurality of voxel intensity values indicative of the internal anatomy surrounding the tumor, wherein each of the first plurality of voxel intensity values are greater than each of the second plurality of voxel intensity values.

Claim 6 (Currently amended): The method of claim 1, wherein ~~generating the processing of the plurality of 3-D digital images~~ the resultant 3-D digital image comprises:

performing an average intensity projection of the ~~plurality of first and second~~ 3-D digital images to obtain the resultant 3-D digital image.

Claim 7 (Currently amended): The method of claim 1, wherein ~~generating processing the plurality of 3-D digital images to obtain~~ the resultant 3-D digital image comprises:

performing a maximum intensity projection of the ~~plurality of first and second~~ 3-D digital images to obtain a ~~first third~~ 3-D digital image;

generating a boundary within the ~~first third~~ 3-D digital image around a predetermined portion of the internal anatomy of the person;

performing a minimum intensity projection of the predetermined portion of the ~~first third~~ 3-D digital image to obtain a ~~second fourth~~ 3-D digital image; and

combining the ~~first third~~ 3-D digital image and the ~~second fourth~~ 3-D digital image to obtain the resultant 3-D digital image.

Claim 8 (Original): The method of claim 7, wherein the resultant 3-D digital image comprises a first region having a first plurality of voxel intensity values indicative of locations of a tumor during at least one respiratory cycle and a second region having a second plurality of voxel intensity values indicative of the internal anatomy surrounding the tumor, the first plurality of voxel intensity values being greater than each of the second plurality of voxel intensity values.

Claim 9 (Original): The method of claim 7, further comprising:
 color coding a portion of the resultant 3-D digital image; and
 displaying the color-coded resultant 3-D digital image on a display monitor.

Claim 10 (Original): The method of claim 7, further comprising displaying the resultant 3-D digital image on a display monitor using a volume rendering technique.

Claim 11 (Original): The method of claim 7, further comprising storing the resultant 3-D digital image in a memory.

Claim 12 (Currently amended): The method of claim 1, wherein generating processing the plurality of 3-D digital images to obtain the resultant 3-D digital image comprises:
 performing a minimum intensity projection of the plurality of first and second 3-D digital images to obtain a first third 3-D digital image;
 generating a boundary within the first third 3-D digital image around a predetermined portion of the internal anatomy of the person;
 performing a maximum intensity projection of the predetermined portion of the first third 3-D digital image to obtain a second fourth 3-D digital image; and
 combining the first third 3-D digital image and the second fourth 3-D digital image to obtain the resultant 3-D digital image.

Claim 13 (Original): The method of claim 12, wherein the resultant 3-D digital image comprises a first region having a first plurality of voxel intensity values indicative of locations of a tumor during at least one respiratory cycle and a second region having a second plurality of voxel intensity values indicative of the internal anatomy surrounding the tumor, the first plurality of voxel intensity values being less than each of the second plurality of voxel intensity values.

Claim 14 (Original): The method of claim 12, further comprising:

color coding a portion of the resultant 3-D digital image; and
displaying the color-coded resultant 3-D digital image on a display monitor.

Claim 15 (Original): The method of claim 12, further comprising displaying the resultant 3-D digital image on a display monitor using a volume rendering technique.

Claim 16 (Original): The method of claim 12, further comprising storing the resultant 3-D digital image in a memory.

Claim 17 (Original): The method of claim 1, wherein scanning the internal anatomy of the person comprises monitoring a position on a chest of the person during respiration by the person to determine the time period of the respiratory cycle of the person.

Claim 18 (Original): The method of claim 1, wherein the at least a portion of the internal anatomy of the person comprises a tumor.

Claim 19 (Original): The method of claim 1, wherein the plurality of cross-sectional digital images comprises a plurality of computerized tomography images.

Claim 20 (Original): The method of claim 1, wherein the plurality of cross-sectional digital images comprises a plurality of magnetic resonance images.

Claim 21 (Currently amended): The method of claim 1, wherein the ~~plurality of~~ first and second 3-D digital images comprises ~~a plurality of~~ first and second 3-D computerized tomography images, respectively.

Claim 22 (Original): The method of claim 1, further comprising displaying at least a portion of the resultant 3-D digital image on a display monitor.

Claim 23 (Original): The method of claim 1, further comprising displaying a 2-D portion of the resultant 3-D digital image on a display monitor.

Claim 24 (Original): The method of claim 1, further comprising:
color coding a portion of the resultant 3-D digital image; and
displaying the color-coded resultant 3-D digital image on a display monitor.

Claim 25 (Original): The method of claim 24, wherein the color-coded resultant 3-D digital image is generated using a volume rendering display technique.

Claim 26 (Currently amended): A system for generating a digital image indicative of an internal anatomy of a person ~~over a respiratory cycle~~, comprising:

a respiratory monitoring device generating a first signal indicative of a respiratory state of the person;

a scanning device configured to scan an internal anatomy of the person to obtain scanning data; and

a computer operably coupled to both the respiratory monitoring device and the scanning device, the computer configured to generate a plurality of cross-sectional digital images based on the scanning data, the computer further configured to generate ~~a plurality of first and second cross-sectional digital image groups associated with the first and second respiratory states, respectively, of the person, the first cross-sectional digital image group including first and second digital images of the plurality of cross-sectional digital images obtained at first and second positions, respectively, along the axis, when the person has the first respiratory state, the second cross-sectional digital image group including third and fourth digital images of the plurality of cross-sectional digital images obtained at third and fourth positions, respectively, along the axis, when the person has the second respiratory state, each group comprising at least two digital images of the plurality of cross-sectional digital images wherein each of the two digital images indicate the internal anatomy at a substantially similar respiratory state, the computer further configured to generate first and second 3-D digital images utilizing the first and second cross-sectional digital image groups, respectively, a plurality of 3-D digital images, wherein each digital image of the plurality of 3-D digital images is determined from a corresponding one of the plurality of cross-sectional digital image groups, the computer further configured to generate process the plurality of 3-D digital images to obtain a resultant 3-D digital image indicating positions of at least a portion of the internal anatomy of the person during at least the respiratory cycle utilizing the first and second 3-D digital images.~~

Claim 27 (Currently amended): The system of claim 26, wherein the computer is being further configured to ~~process the plurality of 3-D digital images, comprises:~~

~~the computer being configured to~~ perform a minimum intensity projection of the ~~plurality of first and second~~ 3-D digital images to obtain the resultant 3-D digital image.

Claim 28 (Currently Amended): The system of claim 27, wherein the ~~wherein the~~ resultant 3-D digital image comprises a first region having a first plurality of voxel intensity values indicative of a tumor and a second region having a second plurality of voxel intensity values indicative of the internal anatomy surrounding the tumor, wherein each of the first plurality of voxel intensity values are less than each of the second plurality of voxel intensity values.

Claim 29 (Currently amended): The system of claim 26, wherein the computer is being further configured to ~~process the plurality of 3-D digital images, comprises:~~

~~the computer being configured to~~ perform a maximum intensity projection of the ~~plurality of first and second~~ 3-D digital images to obtain the resultant 3-D digital image.

Claim 30 (Original): The system of claim 29, wherein the resultant 3-D digital image comprises a first region having a first plurality of voxel intensity values indicative of a tumor and a second region having a second plurality of voxel intensity values indicative of the internal anatomy surrounding the tumor, wherein each of the first plurality of voxel intensity values are greater than each of the second plurality of voxel intensity values.

Claim 31 (Currently amended): The system of claim 26, wherein the computer is being further configured to ~~process the plurality of 3-D digital images, comprises:~~

~~the computer being configured to~~ perform an average intensity projection of the ~~plurality of first and second~~ 3-D digital images to obtain the resultant 3-D digital image.

Claim 32 (Currently amended): The system of claim 26, wherein the computer ~~is being~~ further configured to ~~process the plurality of 3-D digital images, comprises:~~

~~the computer being configured~~ to perform a maximum intensity projection of the ~~plurality of first and second~~ 3-D digital images to obtain a ~~first third~~ 3-D digital image;

the computer being further configured to generate a boundary within the ~~first third~~ 3-D digital image around a predetermined portion of the internal anatomy of the person;

the computer being further configured to perform a minimum intensity projection of the predetermined portion of the ~~first third~~ 3-D digital image to obtain a ~~second fourth~~ 3-D digital image; and

the computer being further configured to combine the ~~first third~~ 3-D digital image and the ~~second fourth~~ 3-D digital image to obtain the resultant 3-D digital image.

Claim 33 (Original): The system of claim 32, wherein the resultant 3-D digital image comprises a first region having a first plurality of voxel intensity values indicative of locations of a tumor during at least one respiratory cycle, and a second region having a second plurality of voxel intensity values indicative of the internal anatomy surrounding the tumor, the first plurality of voxel intensity values being greater than each of the second plurality of voxel intensity values.

Claim 34 (Original): The system of claim 32, wherein the computer is further configured to color code a portion of the resultant 3-D digital image and to display the color-coded resultant 3-D digital image on a display monitor.

Claim 35 (Original): The system of claim 32, further comprising displaying the resultant 3-D digital image on a display monitor using a volume rendering technique.

Claim 36 (Original): The system of claim 32, further comprising storing the resultant 3-D digital image in a memory.

Claim 37 (Currently amended): The system of claim 26, wherein the computer ~~is being~~ further configured to ~~process the plurality of 3-D digital images, comprises:~~

~~the computer being configured~~ to perform a minimum intensity projection of the ~~plurality of first and second~~ 3-D digital images to obtain a ~~first third~~ 3-D digital image;

the computer being further configured to generate a boundary within the ~~first third~~ 3-D digital image around a predetermined portion of the internal anatomy of the person;

the computer being further configured to perform a maximum intensity projection of the predetermined portion of the ~~first third~~ 3-D digital image to obtain a ~~second fourth~~ 3-D digital image; and

the computer being further configured to combine the ~~first third~~ 3-D digital image and the ~~second fourth~~ 3-D digital image to obtain the resultant 3-D digital image.

Claim 38 (Original): The system of claim 37, wherein the resultant 3-D digital images comprises a first region having a first plurality of voxel intensity values indicative of locations of a tumor during at least one respiratory cycle and a second region having a second plurality of voxel intensity values indicative of the internal anatomy surrounding the tumor, the first plurality of voxel intensity values being less than each of the second plurality of voxel intensity values.

Claim 39 (Original): The system of claim 37 wherein the computer is further configured to color code a portion of the resultant 3-D digital image, and to display the color-coded resultant 3-D digital image on a display monitor.

Claim 40 (Original): The system of claim 37, wherein the computer is further configured to display the resultant 3-D digital image on a display monitor using a volume rendering technique.

Claim 41 (Original): The system of claim 37, wherein the computer is further configured to store the resultant 3-D digital image in a memory.

Claim 42 (Currently Amended): The system of claim 26, wherein the at least a portion of the internal anatomy of the person comprises a tumor.

Claim 43 (Original): The system of claim 26, wherein the plurality of cross-sectional digital images comprises a plurality of computerized tomography images.

Claim 44 (Original): The system of claim 26, wherein the plurality of cross-sectional digital images comprises magnetic resonance images.

Claim 45 (Currently amended): The system of claim 26, wherein the ~~plurality of~~ first and second 3-D digital images comprises ~~a plurality of~~ first and second 3-D computerized tomography images, respectively.

Claim 46 (Original): The system of claim 26, wherein the computer is further configured to display at least a portion of the resultant 3-D digital image on a display monitor.

Claim 47 (Original): The system of claim 26, wherein the computer is further configured to display a 2-D portion of the resultant 3-D digital image on a display monitor.

Claim 48 (Original): The system of claim 26, wherein the computer is further configured color code a portion of the resultant 3-D digital image and to display the color-coded resultant 3-D digital image on a display monitor.

Claim 49 (Original): The system of claim 48, wherein the color-coded resultant 3-D digital image is generated using a volume rendering display function.

Claim 50 (Currently amended): An article of manufacture, comprising:

a computer storage medium having a computer program encoded therein for generating a digital image indicative of an internal anatomy of a person ~~over a respiratory cycle~~, the computer storage medium comprising:

code for inducing a scanning device to scan the internal anatomy of the person at a plurality of positions along an axis to obtain scanning data, wherein the scanning at each position is performed over at least one respiratory cycle of the person;

code for generating a plurality of cross-sectional digital images based on the scanning data;

code for generating first and second ~~a plurality of~~ cross-sectional digital image groups associated with the first and second respiratory states, respectively, of the person, the first cross-sectional digital image group including first and second digital images of the plurality of cross-sectional digital images obtained at first and second positions, respectively, along the axis, the when the person has the first respiratory state, the second cross-sectional digital image group including third and fourth digital images of the plurality of cross-sectional digital images obtained at third and fourth positions, respectively, along the axis, when the person has the second respiratory state, each group comprising at least two digital images of the plurality of cross-sectional digital images wherein each of the two digital images indicate the internal anatomy at a substantially similar respiratory state;

code for generating first and second 3-D digital images utilizing the first and second cross-sectional digital image groups, respectively ~~a plurality of 3-D digital images, wherein each digital image of the plurality of 3-D digital images is determined from a corresponding one of the plurality of cross-sectional digital image groups; and~~

code for generating ~~processing the plurality of 3-D digital images to obtain~~ a resultant 3-D digital image indicating ~~positions of~~ at least a portion of the internal anatomy of the person ~~during at least the respiratory cycle~~ utilizing the first and second 3-D digital images.